

Bryobia from Hedera, apple and pear (Acar., Tetr.)

Notulae ad Tetranychidas 1

by

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Introduction.

In 1836 and 1838 the great arachnologist Carl Ludwig KOCH published 4 species of mites for which he created the genus *Bryobia*, viz. *B. praetiosa* and *gloriosa* in 1836, *B. speciosa* and *nobilis* in 1838. Later, in the year 1842, he indicated *B. speciosa* as type of the genus *Bryobia* 1836, but our actual rules of nomenclature do not agree with this as the type of a genus has to be chosen out of those species which were published at the moment of the erection of the new genus in question. So actually *Bryobia praetiosa* C. L. Koch 1.I.1836 is considered as the *typus generis*.

The next point is: What is *Bryobia praetiosa*? This cannot be said with certainty, as no specimens of KOCH are known to be still available. The only details we dispose of, are a rather minute description and a coloured plate, very good for the moment of publication more than a century ago, but insufficient for our requirements of to-day.

It has been pretended that KOCH separated his *Bryobia*-species by colour only, and that these colours would not be valuable for differentiation. By this pronouncement, however, one does a wrong to this arachnologist. KOCH paid much attention to the characters of the living animal and he has recorded them in many cases so eminently that many recent acarologists may follow his example. But moreover KOCH has given in text and plate, also for *Bryobia*, various morphological differences which may be very valuable. So I am convinced that his *B. speciosa* is really a good species, though not the *B. speciosa* pictured by BERLESE (1888), which is quite another animal, and that also *B. gloriosa* is existing. The same conception has been published by A. C. OUDEMANS (1937) in his great work.

Many *Bryobia*-specimens and eventually *Bryobia*-species have been found and mentioned since KOCH's days. *Bryobia* proved to occur on many host plants, differences were stated especially in biological sense, but no sufficiently fixed morphological characters were found to separate all these forms or (biological) races, and the tradition developed to consider them all as "*Bryobia praetiosa*". All publications, especially those dealing with applied entomology, are struggling with this problem of identification. OUDEMANS (1927) has seen morphological differences and has stated that it would be necessary to describe and draw the species very exactly, but he has never been able to work it out.

It is not my intention to give a review of the numerous publications here. I hope to have an occasion later. For the moment I should like to refer to the review of ROOSJE & VAN DINTHER (1953), which gives a recapitulation of the most important species and of the literature.

For years already I knew this *Bryobia*-problem, and I had the impression that notwithstanding the great resemblance of specimens coming from different host plants it must be possible to separate them by morphological characters. This year

I have been able to make a start for studying by the support of the Laboratorium voor Entomologie, Wageningen, and the Nederlandse Organisatie Zuiver-Wetenschappelijk Onderzoek (Z.W.O.).

After having compared material from various plants in the Netherlands and some other countries, I have come to the conclusion that it will be possible to give well defined morphologically separated characters of a certain number — if not all — of *Bryobia*-forms. On this principle I have based the 2 species described hereunder, one of them provisionally without a name owing to the confusion still existing in nomenclature of previous days.

I fully realize that this effort to come to a morphological separation of the *Bryobia*-species will not be more than a first step. I dispose of various other, well defined forms, which will be published as soon as they have been studied sufficiently.

It is not by accident that I have chosen for this first publication out of various well-defined forms those of apple/pear and of ivy (*Hedera helix*). These are 2 of the 3 forms that are the most important for practice. The third one is that of gooseberry (*Ribes uva-crispa* = *grossularia*), and this perhaps is the best known host plant for *Bryobia*, for here we find a real and regular pest expressed in names like "kruisbessenspin" (Netherlands) and "Stachelbeermilbe" (Germany).

I am of opinion that the material I have seen so far, justifies to separate the three biological "races" morphologically. The gooseberry mite is not described here, as it still needs some further study in the coming spring, but the limited material I have seen shows very clear differences. If all gooseberry mites will prove to belong to one form, this will have a name already, viz. *Bryobia ribis* Thomas 1894.

A typical, secondary difficulty is that the individual specimens are varying rather heavily even in those characters which are of morphological value. Notwithstanding this, however, it is possible, after having seen a sufficient number of individuals, to separate them within rather sharp limits.

I have considered at large whether it would be possible or even necessary to maintain the widely spread name "*praetiosa*" for one of the three forms from apple/pear, ivy and gooseberry. I think this to be neither possible nor necessary.

From the moment we start splitting up the species "*Bryobia praetiosa*", and wish to maintain this name for one of the above forms, all forms but one will have to get another name. So there is no objection at all to give another name to all of them. It is even not possible to chose this name „*praetiosa*" for any of these three forms, for C. L. KOCH gives the habitat in his original description of 1836 as follows: "In Gärten, zuweilen auf Gesträuch. Bei Regensburg in den Bösnergarten, selten". The indication "in Gärten" may mean herbaceous plants. The „Gesträuch" cannot be apple or pear, nor *Hedera*, but it might have been *Ribes uva-crispa* (= *grossularia*). However, "zuweilen" means "sometimes", so that this *Ribes* cannot be considered as the normal host plant for *B. praetiosa* Koch (non auct.).

Bryobia praetiosa C. L. Koch 1.I.1836 sensu stricto must be a *Bryobia* living in gardens or parks at Regensburg, not available at present, but most probably morphologically differing from the 3 forms cited above.

It would also not be possible to fix the name for one of the forms of these host plants by depositing a neotype, for the rules of nomenclature prescribe for this that the neotype corresponds as exactly as possible with the original description and is coming from the same geographic region. So first of all it would be necessary to go and collect in the Bösnergarten or in a similar biotope at Regensburg.

It is well known that of "*Bryobia praetiosa*" no ♂♂ are met. Only DUGÈS (1834) indicates males of his "*Tetranychus cristatus*", and then only for those specimens found under stones at Paris in autumn. Moreover ♂♂ are regularly found of *Bryobia sarothamni* Geijskes 1939. I state that DUGÈS does not mention males for his specimens from the Midi on plum trees. So he must have collected more than one species, and as no specimens seem to have been preserved, we have to make a choice for the name "*cristatus*" of DUGÈS. I should like to postpone this until I shall have had occasion to study the *Bryobia* from plum trees in Southern France and that living under stones in the public parks of Paris, for at all events we shall have to take a form which clearly shows the character chosen by DUGÈS for the name "*cristatus*", viz. the dorsum with a depressed centre surrounded by an elevated border (crista).

With this *Bryobia*-problem we have to realize that as far as is known all forms or species, with the exception of *B. sarothamni* Geijskes and *B. cristata* (Dugès pro parte), show a thelytoke parthenogenesis. Now that the value of the biological observations can be confirmed by morphological differences, we have got the same situation as in various other zoological orders, so that in the present state of our knowledge there is no objection to describe the different forms as species.

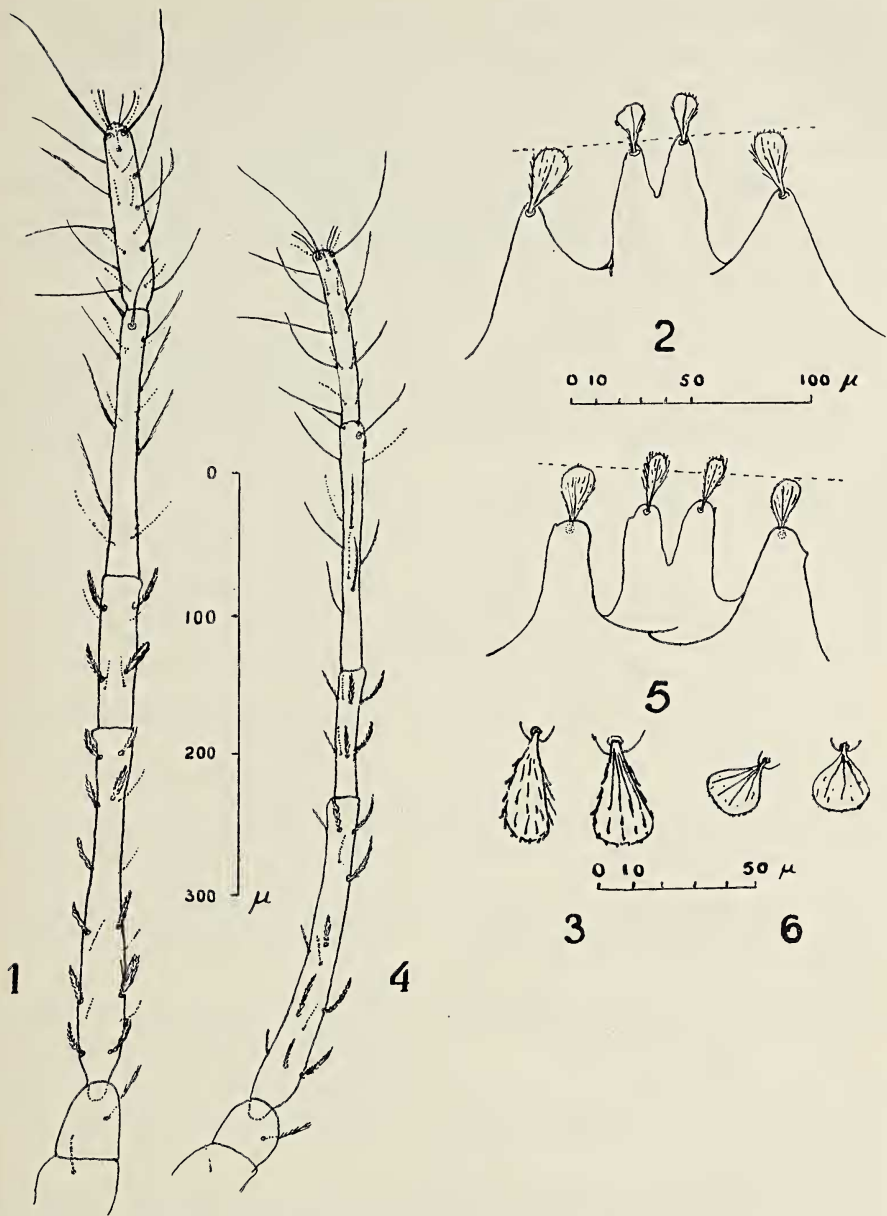
Transfer experiments have been made on various occasions in order to find a solution. I shall not mention them all. Some recent papers are those by ROOSJÈ & VAN DINTHER (1952), MATHYS (1954) and BÖHM (1954), which all confirm once again that at least the great majority of such experiments will show a negative result. In my opinion this fact is not strange at all.

The fact that I have found constant morphological differences not only for the four groups as indicated by MATHYS but also for various "species" in the field, seems to justify their publication, as it may be a help to other workers to know them. I am starting with two forms only of which I have seen a lot of material. Each future form will need a thorough study, as it is my intention to maintain the names of previous authors in all such cases where it will be possible and practical.

When studying this genus I found that, apart from me, Mr. J. MELTZER, 's-Graveland, had compared the morphological characters of *Bryobia* from ivy, apple and pear as well. He showed me his results which will be published in this same number of the Entomologische Berichten, and it is very satisfactory that they are entirely in accordance with my ideas, as is clearly appearing from his text and figures.

The Bryobia from Hedera helix and that from apple/pear.

Now passing on to a description of the two species, I shall confine myself to a comparative review and some sketches. The general characters of *Bryobia* are suf-



Bryobia kissophila: 1. left leg 1, dorsal view; 2. the 4 lobes; 3. two hairs of the posterior body margin. *Bryobia* from apple/pear: 4. left leg 1, dorsal view somewhat dorsolaterally; 5. the 4 lobes; 6. two hairs of the posterior body margin. Fig. 4—5 from apple (loc. 954439), 6 from pear (loc. 954440).

ficiently known and are in their generality the same for all forms, so that they need not be repeated here. Should I be asked, *which* parts of the animal are the most useful for a differentiation, I should say that strictly spoken every part may be of value; the animals are differing in practically all details. But some which show conspicuous and constant characters, are: The size of body and legs, the chaetotaxis of the legs and the proportion between their joints, the shape and details of the 4 front lobes with their 4 hairs, and the shape and size of the hairs on the posterior body margin. It will be good, however, to pay also attention to such details as size, colour and aspect of the living animal, striation of the skin, characters of the palpi, etc.

Bryobia kissophila nov. sp.

Average length after preparation 650 μ

Of the 4 front lobes the exterior ones have a more or less triangular shape and may look like the cinder-cone of a volcano

The indentation between the lobes is rather deep

The hairs on the exterior lobes are from base to top abt. $1\frac{1}{2}$ —2 \times as long as those of the interior lobes

The hairs of the interior lobes show a short, broad shape

The horizontal line passing over the tops of the hairs of the exterior lobes, crosses the hairs of the interior lobes just at their implantation

Length of leg I 640—720 μ

Diameter of tibia I 16 μ

Average proportion of joints of leg I, femur : genu : tibia : tarsus = 260 : 100 : 190 : 130 = 680 μ

Length of leg II abt. $\frac{1}{2}$ of that of leg I

Average length of leg IV, femur : genu : tibia : tarsus = 160 : 80 : 120 : 120 = 480 μ

The hairs on the posterior body margin are somewhat elongated and larger

Host plant: *Hedera helix* L.

Type material of *Bryobia kissophila* mihi.

H o l o t y p e (♀)

's-Heer Hendrikskinderen (Zeeland), 5.VI.1954, leg. M. VAN DE VRIE, Misit Instituut voor Plantenziektenkundig Onderzoek, Proefstation voor de Fruitteelt in de Volle Grond, Wilhelmadorp, cultivated *Hedera*. Coll. Zoologisch Museum, Amsterdam, loc. 954441.

P a r a t y p e s (all ♀)

Netherlands

Amsterdam, Natura Artis Magistra, 23.VIII.1954, leg. G. L. VAN EYNDOVEN, cultivated *Hedera*. Coll. Zool. Mus. Amsterdam, loc. 954476.

Haarlem, Florapark, 25.VIII.1954, leg. G. L. VAN EYNDOVEN, cultivated *Hedera*. Coll. Zool. Mus. Amsterdam, loc. 954529.

Bryobia from apple/pear

Average length after preparation 550 μ

Of the 4 front lobes the exterior ones have a narrow base and a more or less rounded top, and may look like a column with \pm parallel or somewhat conical sides

The indentation between the lobes is rather deep

The hairs on the exterior lobes are from base to top of about the same length as those of the interior lobes

The hairs of the interior lobes show a slender type

The horizontal line passing over the tops of the hairs of the exterior lobes, crosses the hairs of the interior lobes at about their middle

Length of leg I 590—610 μ

Diameter of tibia I 12 μ

Average proportion of joints of leg I, femur : genu : tibia : tarsus = 210 : 100 : 160 : 120 = 590 μ

Length of leg II abt. $\frac{1}{2}$ of that of leg I

Average length of leg IV, femur : genu : tibia : tarsus = 110 : 60 : 100 : 90 = 360 μ

The hairs on the posterior body margin are more or less rounded triangular and smaller

Host plant: apple (*Malus sylvestris* (L.) Mill.) and pear (*Pyrus communis* L.)

- Haarlem, Wagenweg, 25.VIII.1954, leg. G. L. VAN EYNDHOVEN, cultivated *Hedera*. Coll. Zool. Mus. Amsterdam, loc. 954530.
- Bloemendaal, Bloemendaalseweg 111, 25.VIII.1954, leg. G. L. VAN EYNDHOVEN, cultivated *Hedera*. Coll. Zool. Mus. Amsterdam, loc. 954527.
- Heemstede, pad tegenover Crayenesterkade, 29.VIII.1954, leg. G. L. VAN EYNDHOVEN, cultivated *Hedera*. Coll. Zool. Mus. Amsterdam, loc. 954546.
- 's-Heer Hendrikskinderen. Same as holotype.
- Nieuwersluis, Over-Holland, 17.X.1954, leg. G. L. VAN EYNDHOVEN, wild growing *Hedera*. Coll. Zool. Mus. Amsterdam, loc. 954882 and 954883.
- Hengelo (O.), Grundelweg 10, 18.IX.1954, leg. Dr G. KRUSEMAN, cultivated from wild growing *Hedera*, heavily attacked. Coll. Zool. Mus. Amsterdam, loc. 954707.
- Oegstgeest, 4.X.1936, leg. Dr D. C. GEIJSKES. Coll. GEIJSKES in Lab. voor Entomologie, Wageningen.
- Wageningen, 20.II.1936, leg. Prof. Dr W. K. J. ROEPKE. Coll. GEIJSKES in Lab. voor Entomologie, Wageningen.
- Zeeland, 13.III.1954. Coll. Plantenziektenkundige Dienst, Wageningen.
- 's-Graveland, „Boekesteyn”, 1954, leg. J. MELTZER. Coll. Agro-biol. Lab. „Boekesteyn”, 's-Graveland.

France

- Buré la Forge, avril 1930, sur feuille de Lierre, Don de Mr. HEIM DE BALZAC. Coll. Muséum Nat. d'Histoire Naturelle, Paris.

Switzerland

- Basel, Naturhistorisches Museum, 19.I.1955, leg. Dr G. KRUSEMAN, on cultivated *Hedera*. Coll. Zool. Mus. Amsterdam loc. 955041 and Coll. Naturhist. Mus. Basel.
- Liestal (Baselland), Baselerstrasse, 20.I.1955, leg. Dr G. KRUSEMAN, on cultivated *Hedera*. Coll. Zool. Mus. Amsterdam, loc. 955042.

Material of *Bryobia* from apple (*Malus sylvestris*)

Netherlands

- Kloetinge (Zeeland), 4.VI.1954, leg. M. VAN DE VRIE, orchard with apple and pear mixed. Misit Instituut voor Plantenziektenkundig Onderzoek, Proefstation voor de Fruitteelt in de Volle Grond, Wilhelminadorp, Coll. Zool. Mus. Amsterdam, loc. 954439.
- Haarlem, Floraplein 9, 11.IX.1954, leg. G. L. VAN EYNDHOVEN. Coll. Zool. Mus. Amsterdam, loc. 954685.
- Maastricht, Mergelweg, 4.IX.1954, leg. G. L. VAN EYNDHOVEN. Coll. Zool. Mus. Amsterdam, loc. 954623.
- Netherlands, ± 1950, don. G. L. VAN EYNDHOVEN. Coll. Zool. Mus. Amsterdam, loc. 955055.

- Wageningen, tuin Laboratorium, 24.V.1937, leg. Dr. D. C. GEIJSKES. Coll. GEIJSKES in Lab. voor Entomologie, Wageningen.

- Geldermalsen, 9.VI.1954. Coll. Plantenziektenkundige Dienst, Wageningen.

Belgium

- Gorssem, Opzoekingsstation, 18.VIII.1954, leg. Dr Ir A. SOENEN. Coll. Zool. Mus. Amsterdam, loc. 954477.

Material of *Bryobia* from pear (*Pyrus communis*)

Netherlands

- Kloetinge (Zeeland), same as cited for apple, mixed orchard. Coll. Zool. Mus. Amsterdam, loc. 954440.

- Netherlands, ± 1950, don. G. L. VAN EYNDHOVEN. Coll. Zool. Mus. Amsterdam, loc. 955056.

- Wageningen, V.1912, leg. Prof. Dr J. RITZEMA BOS. Coll. A.C. OUDEMANS in Rijksmus. van Nat. Historie, Leiden, as *Bryobia cristata* No. 5.

- 's-Graveland, „Boekesteyn”, 1954, leg. J. MELTZER. Coll. Agro-biol. Lab. „Boekesteyn”, 's-Graveland.

- Hilversum, 1954, leg. J. MELTZER, Coll. Agro-biol. Lab. „Boekesteyn”, 's-Graveland.

France

Régistre 467, en grande quantité sur la face supérieure d'un Poirier (quelques-uns à la face inférieure), dans un jardin à Saint-Maur (Seine), 4.V.1948, leg. M. ANDRÉ. Coll. Muséum Nat. d'Hist. Nat., Paris.

Germany

Birnbaum, Hamburg-Altona, 9.VI.1904. As *B. praetiosa* Dr Zacher det. 1913. Coll. Zool. Mus. Amsterdam loc. 955079 and Coll. Zool. Staatsinstitut, Hamburg.

I have called the mite from *Hedera helix* L. (ivy, Netherlands: klimop) *Bryobia kissophila* (Gr. *κισσός* = *Hedera philēin* = to love, to like), because so far the transfer experiments have shown that this animal is almost entirely specialized on this host plant, and because it seems that not one previously given name refers to the *Bryobia* from *Hedera helix*.

ROOSJE & VAN DINTHER had some transfer success with *Zinnia elegans* Jacq., BÖHM mentions clover and some grasses, and Mr. M. VAN DE VRIE (in litteris) told me that notwithstanding a big mortality some ivy mites seem to have settled on apple after a forced transfer.

No name is mentioned at the moment for the *Bryobia* from apple/pear, as I prefer to try and reserve for it one of the old names. It would be premature to do it now, as the situation is still too confused. I have noted the following names in this respect:

Bryobia cristata (Dugès 1834 pro parte), from plum, see above;

Bryobia rubrioculus (Scheuten 1857) from pear at Bonn;

Bryobia pyri (Boisduval 1866) from pear in France.

Bryobia biculus (Amerling 1862) can be rejected, as evidently it is not more than a lapsus calami for *B. rubrioculus* (Scheuten 1857).

A. C. OUDEMANS, who has studied and drawn various forms of *Bryobia* seems to have never seen the form of *Hedera*. At least he has never made a drawing of it. GEIJSKES knew it, however, and on this he has based his figure of *Bryobia praetiosa* (1939). His drawing does not correspond completely with my figures, which will be due to the smaller scale. I have studied the original slides of GEIJSKES, which are at the Laboratorium voor Entomologie at Wageningen, and in every respect, also as regards the shape of the 4 lobes and the hairs on the legs, they are in accordance with my observations from other sources. The slides from apple, present in GEIJSKES' collection, correspond with the other specimens from apple/pear I have seen.

For good order's sake I observe that one single character often is not sufficient to distinguish the species. This first of all refers to the 4 lobes, which for not two individuals seem to be exactly identical, and which can be varying heavily. Yet, for systematic purposes they are much more useful than generally has been thought, as through all these fluctuations there runs a general line of for each species typical features. For identification of a species it will be necessary to consider the whole complex of characters. Those indicated here seem to be the most striking ones; more differences can easily be found. If a character given above is not a differentiating one, it should be kept in mind as being useful when comparing other species.

I am grateful to all who have sent me their specimens for study or have assisted me in other respects.

I shall be pleased to receive further *Bryobia*-specimens from as many food plants as possible, as an extensive material will be necessary to distinguish future species with sufficient certainty.

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Araschnia levana L. Zowel de voorjaars- als de zomergeneratie vloog in aantal te Empe. De *prorsa*'s vlogen ook in aantal te Wiessel, waar ik ze te voren nooit zag. Ondanks de ongunstige zomer houdt de vlinder blijkbaar goed stand.

W. J. BOER LEFFEEF, Korteweg 53, Apeldoorn.

Correctie. Op p. 276 moet regel 7 van boven vervangen worden door de volgende woorden: Elaterids (larvae) have been observed particularly as enemies of white grubs living.

Styrexplaten. Zie Ent. Ber. 15 : 270 (1954). Daar het oorspronkelijke type plaat in de practijk niet bleek te voldoen, heeft de firma Kooy een zwaarder type gefabriceerd. De prijs hiervan is echter f 2.— per plaat in plaats van f 1,10 en de naam nu : Tempex-25 plaat.

Keverruil. De heer Aldo OLEXA, Lucemburská 43, Praha XI, C.S.R., wil gaarne kevers uit Midden-Europa en eventueel Japan ruilen tegen kevers van andere landen. Correspondentie in het Duits.

Amsterdam, Zeeburgerdijk 21.

G. L. VAN EYNDHOVEN, Secretaris